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# Descriptions and Biological Notes on Two New Phytophagous Species of the Genus *Allorhogas* from Brasil (Hymenoptera: Braconidae: Doryctinae)

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*Abstract.*—Two new species of the genus *Allorhogas* are described from the Poço das Antas Biological Reserve, Rio de Janeiro State, Brasil: ***A. spermaphagus* Marsh,** reared from seed pods of *Stryphnodendron polyphyllum* (Leguminosae) and ***A. brasiliensis* Marsh,** reared from seed pods of *Pithecellobium pedicellare* (Leguminosae). Biological notes are provided and a key is presented to the species reared from plant seeds or galls in Brasil.

For centuries, species in the family Braconidae were thought to be always parasitoids of other insects. Macêdo and Monteiro (1989) presented the first documented case of phytophagy in the family Braconidae for a species of the braconid genus *Allorhogas* (subsequently described as *A. dyspistus* by Marsh 1991) which attacks seeds of the legume *Pithecellobium tortum* Martius in Brasil. Since then, more records of phytophagy in the Braconidae have been noted. Infante, et al. (1995) showed that species of the genus *Monitoriella* formed galls on *Philodendron* in Central and South America. Ramirez and Marsh (1996) described two species of the genus *Psenobolus* from Costa Rica which develop as inquilines in figs. Recently, Austin and Dangerfield (1998) showed that a species of the genus *Mesostoa* forms galls on *Banksia* in Australia and Macêdo et al. (1998) provided further information on the biology of *A. dyspistus* in Brasil. One of us (PMM) has seen a new species of *Allorhogas* from Costa Rica that has been reared from another species of *Pithecellobium*. Thus, it is now well established that phytophagy does occur in the family Braconidae.

For many years, there have been records of species in the genus *Allorhogas* being reared from plant galls but no firm biological data was available. For example, *A. galicola* Gahan was reared from oak galls (Gahan 1912) and *A. heringeri* (Guimarães) and *A. muesebecki* (Guimarães) were reared from plant galls (Guimarães 1957). No species have ever been definitely reared as parasitoids of other insects in galls or seed pods. As noted above and from the biological information presented here, it is now firmly established that species in the genus attack seed pods and are not parasitic on any other insect. Furthermore, several undescribed species from Costa Rica have been reared from various leaf galls, although no detailed biological studies have yet been made.

The following new species of the genus *Allorhogas* are described in order to provide names for further biological studies being done by two of us (MVM, MCPP). These species were reared from seeds of *Stryphnodendron polyphyllum* Martius and *Pithecellobium pedicellare* (DC.) Benth. in Brasil and preliminary observations are given under each species description be-

low. The genus is in need of study for the Neotropical Region. There are an estimated 50 species from Brasil, nearly all undescribed and mostly without biological information. A study is in progress on the genus from Costa Rica with an estimate of 25 undescribed species.

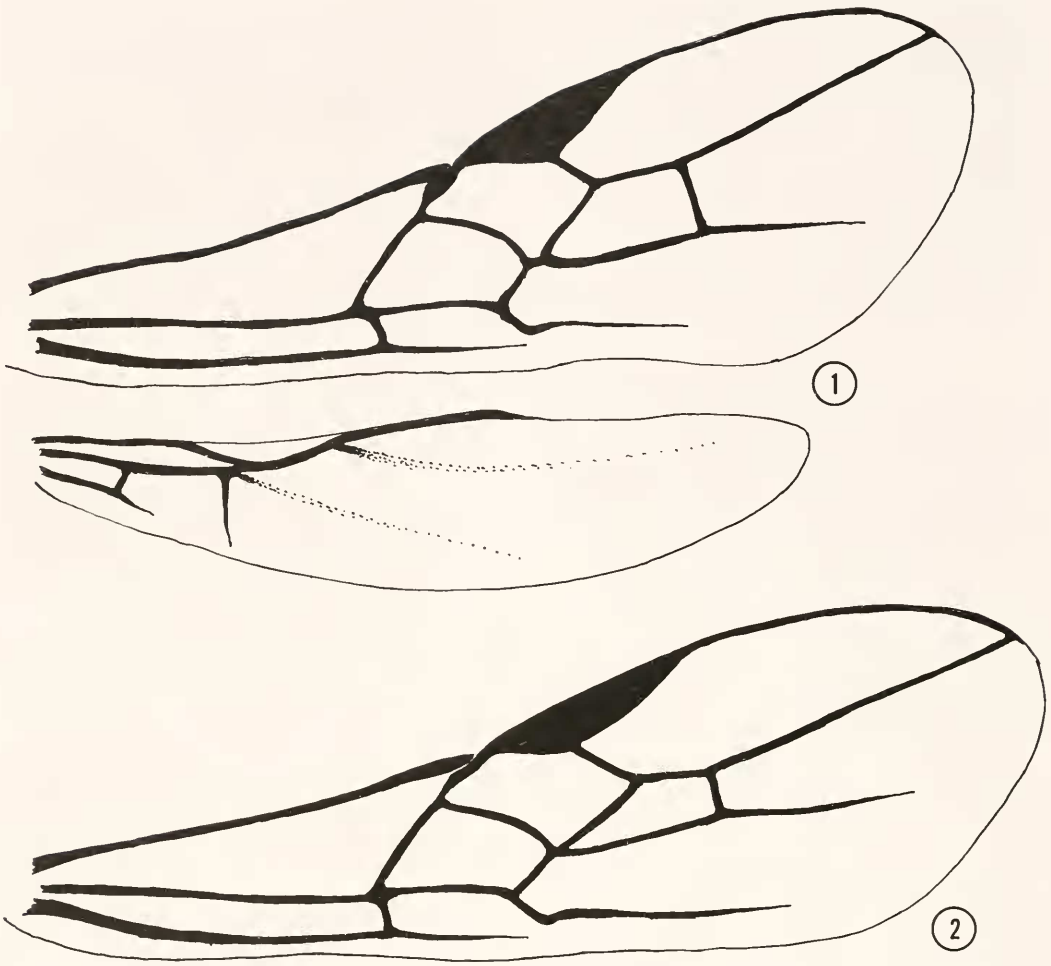
The names of the two new species are to be attributed only to the senior author; all biological observations were made by the junior authors. The genus *Allorhogas* can be identified by keys presented in Marsh (1997). Morphological terminology is based on Wharton, et al. (1997).

KEY TO SPECIES OF *ALLORHOGAS* REARED FROM PLANT SEEDS OR GALLS IN BRASIL
(Based on females only)

1. Ovipositor barely visible, shorter than first metasomal tergum ..... 2
– Ovipositor at least half as long as metasoma ..... 3
2(1). Malar space 2/5 eye height ..... ***dyspistus* Marsh**
– Malar space nearly equal to eye height ..... ***muesebecki* (Guimarães)**
3(1). Fore wing vein m-cu arising distad of vein 2RS ..... ***heringeri* (Guimarães)**
– Fore wing vein m-cu interstitial with or arising basad of vein 2RS ..... 4
4(3). Fore wing vein m-cu interstitial with 2RS (Fig. 2); body length 3.50–3.75 mm; 29–30 antennomeres, flagellum light brown ..... ***spermaphagus* Marsh, new species**
– Fore wing vein m-cu arising basad of 2RS, thus a short section of (RS+M)b present (Fig. 1); body length 4.0–4.5 mm; 34–35 antennomeres, flagellum honey yellow on basal 1/2, brown on apical 1/2 ..... ***brasiliensis* Marsh, new species**

### *Allorhogas spermaphagus* Marsh, new species
(Figs. 2–6)

*Female.*—**Body color**: head, mesosoma and metasoma honey yellow; legs yellow; flagellum and pedicel light brown; wings hyaline, fore wing vein C+Sc+R and stigma yellow, rest of veins light brown, hind wing veins yellow. **Body length**: 3.50–3.7 mm. **Head**: 29–30 antennomeres; face rugulose-coriaceous medially, strongly rugose along inner eye margins; frons excavated, coriaceous; vertex (Fig. 3) coriaceous, weakly rugulose behind ocelli; temple coriaceous; malar space 1/3 eye height; oral opening small, circular, diameter equal to basal width of mandible; ocell-ocular distance twice diameter of lateral ocellus; occipital carina distinct, meeting hypostomal carina. **Mesosoma** (Figs. 4–5): pronotum weakly rugulose-coriaceous laterally with deep median scrobiculate groove bordered ventrally by carina; mesonotum sharply declivous anteriorly, mesonotum and scutellum coriaceous, middle lobe with median scrobiculate groove extending to anterior edge of mesonotum; notauli distinctly scrobiculate, meeting in large rugose area before scutellum; scutellar furrow with three cross carinae; mesopleuron coriaceous, sternaulus deep and smooth or weakly scrobiculate; propodeum rugose, with two baso-lateral semicircular rugulose-coriaceous areas enclosed by carina, apical area above metasoma insertion usually smooth, enclosed by carina. **Legs**: fore tibia with scattered row of 15–20 stout spines on anterior edge; hind coxa with distinct baso-lateral tubercle. **Wings** (Fig. 2): fore wing vein r nearly as long as 3RSa, vein m-cu interstitial with 2RS, first subdiscal cell open, vein 2cu-a absent; hind wing vein M+CU about equal in length to 1M, vein m-cu curved slightly toward wing apex. **Metasoma** (Fig. 6): first tergum longitudinally costate-rugulose, wider at apex than long, medially with two strong longitudinal carinae setting off raised median area and




Figs. 1–2. Wings of *Allorhogas* species. 1, *brasiliensis* n. sp. 2, *spermaphagus* n. sp.

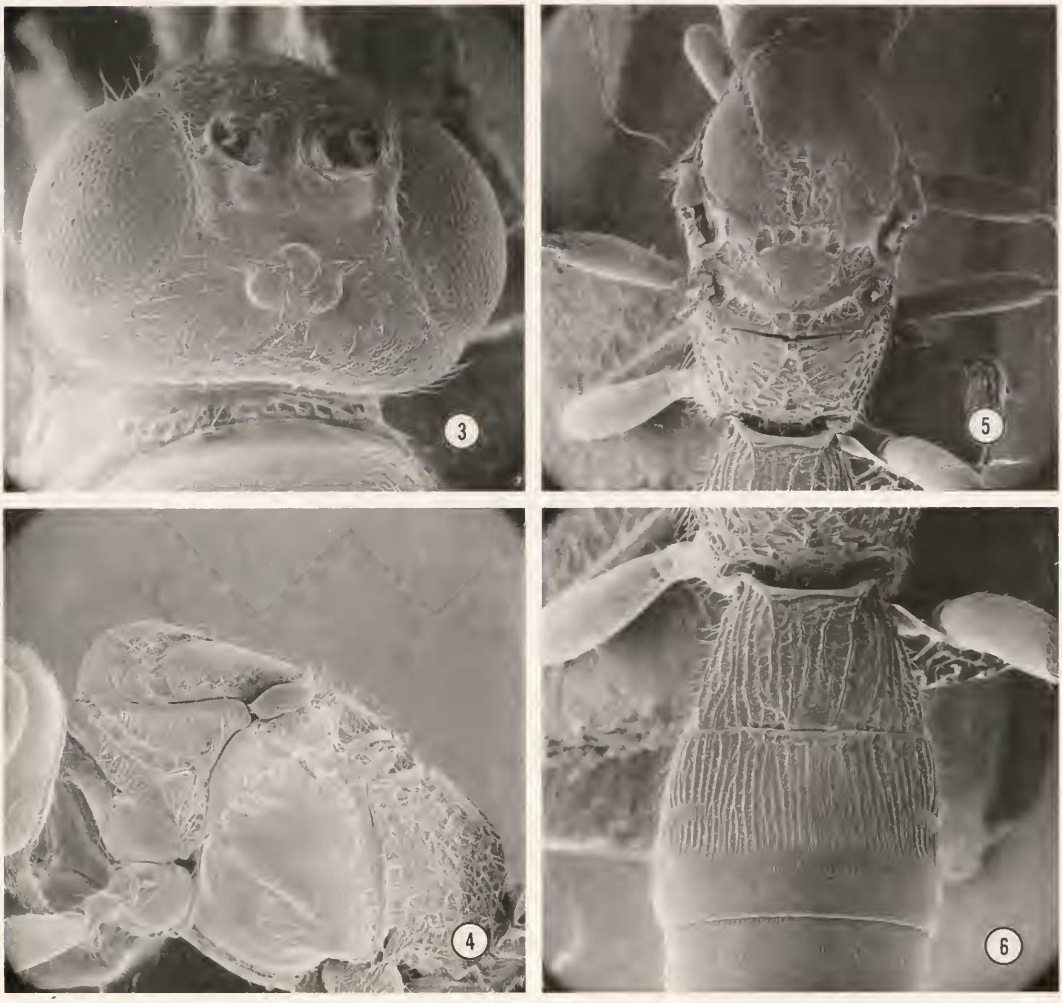
connected at base by distinct cross carina; tergum 2+3 longitudinally costate on basal 2/3, remainder coriaceous, groove between terga 2 and 3 weak or absent; tergum 4 costate on basal 1/5, remainder coriaceous; remainder of terga coriaceous; ovipositor about 2/3 length of metasoma.

*Male.*—Essentially as in female; femora swollen, hind femur with length about twice width.

*Holotype Female.*—BRASIL: Poço das Antas Biological Reserve, Silva Jardim County, Rio de Janeiro State, September 1995, M. V. Macêdo, reared from seeds of *Stryphnodendron* sp. Deposited in Departamento de Ecologia-IB-CCS, Universidad Federal do Rio de Janeiro, Brasil.

*Paratypes.*—BRASIL: 7 females, 4 males, same data as holotype. Deposited in: Universidade Federal do Rio de Janiero, Brasil; Universidade Federal de São Carlos, Brasil; National Museum of Natural History, Washington, DC.

*Comments.*—This species is very similar to *brasiliensis*, but the most consistent distinguishing characters are: smaller size (3.5–3.75 mm) than in *brasiliensis* (4.0–4.5); antenna with 29–30 antennomeres (34–35 in *brasiliensis*); entirely brown flagellum (yellow at base, brown at apex in *brasilien-*




Figs. 3–6. *Allorhogas spermaphagus* n. sp. 3, vertex. 4, mesosoma, lateral view. 5, mesosoma, dorsal view. 6, metasoma, dorsal view.

*sis*); fore wing vein m-cu interstitial with vein 2RS (basad of 2RS in *brasiliensis*); fore wing vein r about equal to vein 3RSa (3/4 length of 3RSa in *brasiliensis*). In some specimens of *spermaphagus* the face is often more distinctly rugose near the eyes than in *spermaphagus*; also the vertex of *spermaphagus* is often rugulose behind the ocelli but usually only coriaceous in *brasiliensis*.

*Biology*.—This species was reared from seeds of *Stryphnodendron polyphyllum* Martius (Leguminosae) which is native to the Atlantic forest region of Brasil. The biology is similar to that described for *A. dyspistus* by Macêdo and Monteiro (1989) and Macêdo et al. (1998). Pods of *Stryphnodendron* contain about 10 seeds arranged side by side. The *Allorhogas* female oviposits directly into immature seeds when abundant endosperm and a small embryo are still present. Oviposition is directly through the pod wall and the egg is placed inside the seed. After oviposition by the braconid, the seed divides internally and externally (see Macêdo et al. (1998)), resulting in an intact region joined to the funicle where the seed embryo is

usually found. In many cases this region of the seed continues growing even after the adult *Allorhogas* has emerged. In most of the attacked seeds that were observed (n = 34) more than one *Allorhogas* was found in a single seed—29% were observed to have two braconids per seed and 62% had three per seed. In these cases, more than one division of the seed occurs but a single intact region is still found with the seed embryo.

Two species of chalcid wasps were reared from the same pods: *Lycrus* sp. (Pteromalidae) and *Eurytoma* sp. (Eurytomidae). Although we did not observe these wasps emerging directly from *Allorhogas* larvae, one was observed feeding on an *Allorhogas* larva. Because the chalcid pupae were dissected from seeds exhibiting the same damage caused by the braconids, we are assuming the chalcids were attacking the *Allorhogas*.

*Etymology*.—The specific name is from the Greek *sperma* meaning seed and the Greek *phagein* meaning to eat in reference to the biology of this seed-eating braconid.

### *Allorhogas brasiliensis* Marsh, new species
(Fig. 1)

*Female*.—**Body color**: head, mesosoma and metasoma dark honey yellow, propodeum and mesonotum often light brown; legs yellow; flagellum honey yellow on basal 1/2, turning to brown on apical 1/2; wings hyaline, fore wing vein C+Sc+R yellow, stigma brown, rest of veins light brown, hind wing veins yellow. **Body length**: 4.0–4.5 mm. **Head**: 34–35 antennomeres; face rugulose-coriaceous; frons excavated, coriaceous; vertex and temple coriaceous; malar space 1/3 eye height; oral opening small, circular, diameter equal to basal width of mandible; ocell-ocular distance twice diameter of lateral ocellus; occipital carina distinct, meeting hypostomal carina. **Mesosoma**: pronotum weakly rugulose-coriaceous laterally with deep median scrobiculate groove bordered ventrally by carina; mesonotum sharply declivous anteriorly, mesonotum and scutellum coriaceous, middle lobe with median scrobiculate groove not extending to anterior edge of mesonotum; notauli distinctly scrobiculate, meeting in large rugose area before scutellum; scutellar furrow with three cross carinae; mesopleuron coriaceous, sternaulus deep, scrobiculate; propodeum rugose, with two baso-lateral semicircular rugulose-coriaceous areas enclosed by carina, apical area above metasoma insertion strongly rugose. **Legs**: fore tibia with scattered row of 15–20 stout spines on anterior edge; hind coxa with distinct baso-lateral tubercle. **Wings** (Fig. 1): fore wing vein r about 3/4 length of 3RSa, vein m-cu meeting RS+Ma slightly before 2RS, thus a short segment of (RS+M)b visible, first subdiscal cell open, vein 2cu-a absent; hind wing vein M+CU about 3/4 length of 1M, vein m-cu curved slightly toward wing apex. **Metasoma**: first tergum longitudinally costate, wider at apex than long, medially with two strong longitudinal carinae setting off raised median area and connected at base by distinct cross carina; tergum 2+3 longitudinally costate on basal 2/3, remainder coriaceous, groove between terga 2 and 3 weak or absent; tergum 4 costate on basal 1/5, remainder coriaceous; remainder of terga coriaceous; ovipositor slightly more than 1/2 length of metasoma.

*Male*.—Essentially as in female; femora swollen, hind femur with length about twice width; propodeum and first metasomal tergum dark brown.

*Holotype Female*.—BRASIL: Poço das Antas Biological Reserve, Silva Jardim County, Rio de Janeiro State, October 1995, M. C. Pimentel, reared from seeds of *Pithecellobium* sp. Deposited in Departamento de Ecologia-IB-CCS, Universidad Federal do Rio de Janeiro, Brasil.

*Paratypes*.—BRASIL: 6 females, 6 males, same data as holotype. Deposited in Universidade Federal do Rio de Janiero, Brasil,

Universidade Federal de São Carlos, Brasil, and National Museum of Natural History, Washington, DC.

*Comments.*—See comments under *spermaphagus* for distinguishing characters of the two species.

*Biology.*—This species was reared from seeds of *Pithecellobium pedicellare* (DC.) Benth. Preliminary observations show that the biology is similar to that of *A. spermaphagus*. The seed damage caused by both *A. spermaphagus* and *A. brasiliensis* is very similar to that observed for *A. dyspistus*.

*Etymology.*—The specific name is in reference to the locality of this species.

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